NASHVILLE DISTRICT HYDROPOWER SYSTEM PLANNING PROGRESS UPDATE

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LRD/Nashville District
9 October 2019



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MASTER PLAN COMPONENTS

General Organization:

Purpose and Objectives of the Master Plan

Nashville District Overview and History

Hydropower Rehabilitation Program and History

Program Authorization and Funding (both Section 212 & Appropriated)

20 Year Master Program Plan

5 Year Program Detailed Plan

Hydropower Asset Management Program

LRN Hydropower Program Statistics

Individual Power Plan Development Plans

Communication Objectives:

Provide information on the past, present and future of the LRN Hydropower Rehabilitation Program.

The Master Plan will be the document used for both appropriated and Section 212 funding requests.

Activities:

Rough draft of the report has been developed.

A spreadsheet documenting the status of completion for all projects has been drafted.













MASTER PLAN UPDATE SCHEDULE

October: Operations update and/or identify HydroAmp and other

scores needed for assessment.

November: Operations input scores and identify priority list (1-n),

manual adjustments as needed.

December: Hold meeting 1st week of December with Ops/EC/PM to

review priority list and gain consensus.

January: - Programming Month - Section 212 PgM develops funding

projections.

- Projections feed schedules, outage plan, and budgets.

- Review outage plan for manual adjustments.

February: Compile final draft of Master Plan.

March: Review and publish as final for customer input.







LRN CY 2020 Hydro Unit Master Outage Schedule (as of 08 October 2019)																																																						
Hydropower Plant	Unit #	Avail MW	12/30/2019	1/6/2020	1/13/2020	1/20/2020	1/27/2020	2/3/2020	2/10/2020	2/17/2020	2/24/2020	3/2/2020	3/8/2020	3/16/2020	3/23/2020	3/30/2020	4/6/2020	4/13/2020	4/20/2020	4/27/2020	5/4/2020	5/11/2020	5/18/2020	5/25/2020	611/2020	6682020	6115/2020	00000000	912912000	716/2020	7/13/2020	7/20/2020	712712000	8290000	8/16/2020	847772820	SIGNED SOLD	9/202020	9/14/2020	9/21/2020	9/28/2020	10/5/2020	10/12/2020	10/18/2020	10/26/2020	11/2/2020	11/8/2020	11/16/2020	11/23/2020	11/30/2020	12,7,2020	12/14/2020	12/21/2020	12/28/2020
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Project	Unit#	Out of Service	Return to Service	Reason Out of Service / Maintenance
Barkley	die	03-Aug-20	27-Sep-20	Transformer Installation
Barkley	2	15-Mar-20	29-Mar-20	Complete Unit inspection
Barkley	2	03-Aug-20	27-Scp-20	Transformer Installation
Barkley	- 3	28-Sep-20	22-Nov-20	Transformer Installation
Barkley	4	20-Apr-20	02 May 20	Complete Unit Inspection
Barkley	1	28-Sep-20	22-Nov-20	Transformer Installation
Barkley	Plant	N/A	N/A	Powerhouse Roof Replacement
Barkley	Plant	N/A	N/A	SCADA Installation
Center Hill		01-Jan-20	02-Aug-20	Turbine Generator Rehap
Center HIII	100	23-Ndv-20	13-Dec-20	leardworks - Intake Gate Hoist Machinery
Center Hill	2	14-Dec-20	31-Dec-20	Headworks - Intake Cate Hoist Machinery
Center Hill	3	01-Jan-20	03-May-20	Turbine Generator Rehab
Center Hill	Plant	N/A	N/A	HVAC System Modifications
Cheatham	2	21-Sep-20	04 Oct-20	Complete Unit inspection
Cheatham	2	09-Mar-20	5-Mar-20	Partial Unit Inspection
Cheatham	Plant	N/A	N/A	Forebay Debris Removal - Regional Fleet
Cordell Hull		07-Sep-20	20-Sep-20	Complete Unit Inspection
Cordell Hull	2	05-Apr-20	12-Apr-20	Partial Unit Inspection
Dale Hollow	7 7	24-Fcb-20	15-Mar-20	Headworks - Intake Gate Hoist Machinery
Dale Hollow	3 3	10-Aug-20	22-Nov-20	Dissolved Oxygen Levels - NMT 2 Units Max
Dale Hollow	2	18 Mar-20	05-Apr-20	Headworks - Intake Gate Hoist Machinery
Dale Hollow	2	28-Sep-20	11-Ort-20	Complete Unit Inspection
Dale Hollow	3	23-Mar-20	29-Mar-20	Partial Unit Inspection
Dale Hollow	3	06-Apr-20	26-Apr-20	Headworks - Intake Gate Hoist Machinery
Date Hollow	Plant	N/A	N/A	Cable Tray Replacement

OUTAGE SCHEDULE LEGEND :

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- 5	EPA Outage Restriction	O&M Unit Inspection Outages	O&M Specific Work - Maint	Section 21	2 Program Work	Expected Water 0	Quality Issues Expected Hydrologic Limitati
0	Return to Service	Reason Out of Service / Maintenance	Project	Unit#	Out of Service	Return to Service	Reason Out of Service / Maintenance
	27-Sep-20	Transformer Installation	J. Percy Priest	Plant	18-May-20	02-Aug-20	Water Quality - No Generation
7	29-Mer-20	Complete Unit inspection	J. Percy Priest	Plant	N/A	N/A	Arc Flash Hazard Mitigation
1	27-Scp-20	Transformer Installation	J. Percy Priest	Plant	03-Aug-20	22-Nov-20	Expected Hydrologic Limitations
7	22-Nov-20	Transformer Installation	Old Hickory	3	C4-May-20	17-May-20	Complete Unit Inspection
1	03 May 20	Complete Unit Inspection	Old Hickory	- 4	01-Jan-20	24-May-20	Turbine Generator Rehad - Bushing Replacement
1	22-Nov-20	Transformer Installation	Old Hickory	Flant	N/A	N/A	Conduit & Cable Replacement
1	N/A	Powerhouse Roof Replacement	Wolf Creek	1	29-Jun-20	19-Jui-20	Headworks - Intake Gate Holst Machinery
1	NA	SCADA Installation	Wolf Creek	2	07-Sep-20	22-Nov-20	Dissolved Oxygen Levels - NMT 3 Units Max
1	02-Aug-20	Turbine Generator Rehab	Wolf Creek	2	30-Mar-20	05-Apr-20	Partial Unit Inspection
İ	13-Dec-20	leardworks - Intake Gate Hoist Machinery	Wolf Creek	2	20-Jul-20	09-Aug-20	Headworks - Intake Gate Hoist Machinery
t	31-Dec-20	Headworks - Intake Cate Hoist Machinery	Wolf Creek	4	07-Sep-20	14-Sep-20	Dissolved Oxygen Levels - NMT 3 Units Max
İ	03-Mary-20	Turbine Generator Rehab	Wolf Creek	4	19-Oct-20	22-Nov-20	Dissolved Caygen Levels - NMT 3 Units Max
1	N/A	HVAC System Modifications	Wolf Creek	3	02-Mar-20	15-Mar-20	Complete Unit Inspection
İ	04 Oct-20	Complete Unit inspection	Wolf Creek	3	10-Aug-20	08-Sep-20	Headworks - Intake Gate Hoist Machinery
Ī	6-Mar-20	Partial Unit Inspection	Wolf Creek	- 6	14-Sep-20	22-Nov-20	Dissolved Oxygen Levels - NWT 3 Units Max
İ	N/A	Forebay Debris Removal - Regional Fleet	Wolf Creek	- 4	14-Sep-20	18-Oct-20	Headworks - Intake Cate Holst Machinery
1	20-Sep-20	Complete Unit Inspection	Wolf Creek	- 5	18-May-20	24-May-20	Partial Unit Inspection
Ī	12-Apr-20	Partial Unit Inspection	Wolf Creek	- 5	17-Aug-20	13-Sep-20	Headworks - Intake Gate Holst Machinery
Į	15-Mar-20	Headworks - Intake Gate Hoist Machinery	Wolf Creek	- 6	20 Apr 20	03 May 20	Complete Unit Inspection
1	22-Nov-20	Dissolved Oxygen Levels - NMT 2 Units Ma:	x Wolf Creek	- 6	28-Sep-20	25-Oct-20	Headworks - Intake Gate Hoist Machinery
1	05-Apr-20	Headworks - Intake Gate Hoist Machinery	Wolf Crock	Plant	N/A	N/A	Monolih Repairs
1	11-Ort-20	Complete Unit Inspection	System Wide	Plant	N/A	N/A	Security System Upgrades
1	29-Mar-20	Partial Unit Inspection	System Wide	Plant	N/A	N/A	SCADA Replacement
1	26-Apr-20	Headworks - Intake Gate Hoist Machinery	SEPA Restriction	All	01-Jun-20	31-Aug-20	SEPA Outago Restriction Period
1	N/A	Cable I ray Regiscement					

LRN HYDROPOWER O&M MAINTENANCE UPDATE

David Mistakovich
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9 October 2019

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CENTER HILL TRUNNION PIN AND SEALS REPLACEMENT / SPILLWAY ELEC/MECH REPAIR



Scope

- Replace the trunnion pin for spillway gate 7
- Replace J-Seals on all spillway gates
- Add metal ladders to each pier to allow for inspection and maintenance of trunnion pins
- Rehabilitation for the spillway gate machinery for each gate

Total Project Cost

- \$7.2 million
 - \$5.7 million for the Spillway Gate Machinery
 - \$1.5 million for the Trunnion Pin / J-Seals

Progress

- Machinery work completed on Gates 6 thru 8.
- Working on Gates 2 thru 5.









BARKLEY TRASH SCREEN



Scope

 To replace the existing trash screens which have holes and gaps allowing large debris to enter scroll case and damage turbine

Total Project Cost

- \$3.53 Million

Progress

- Contract has been awarded at \$2.18 Million.
- Sections currently arriving on site.
- \$1.346 for installation not currently funded.







SECURITY SYSTEM UPGRADE



Scope

 Security systems are being replaced at Barkley, Center Hill, Cheatham, Cordell Hull, Dale Hollow, J.P. Priest, and Old Hickory.

Total Project Cost

- \$3.5 million (Joint)
- \$1.2 million (Hydro portion)

Progress

Performance verification tests at Cheatham,
 J.P. Priest and Old Hickory in October.
 Currently installing equipment at Cordell Hull.







SCADA REPLACEMENT AT CHE/P, JPP/P, CEN/P, DAL/P, LAU/P & BARKLEY TO REMOTE CAPABLE



Scope

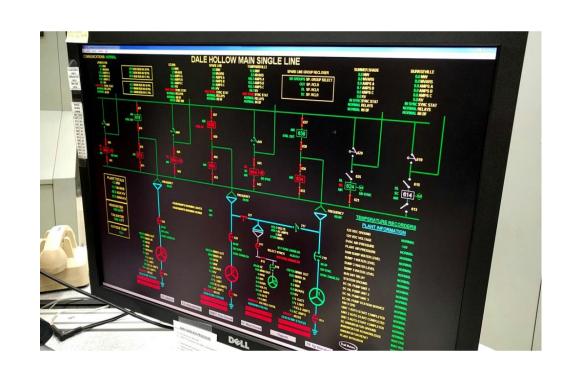
 To replace the five existing SCADA systems (Cheatham, J.P. Priest, Center Hill, Dale Hollow, Laurel), Also converting Barkley to being capable of remote operation.

Total Project Cost

\$3.9 Million.
 \$2.645 million (includes 127K for Barkley) for contract with remainder for engineering (including design) and installation.

Progress

 Contract awarded to HSQ Technology.
 Installation at Old Hickory and Cordell Hull (master plants) beginning in January2020.

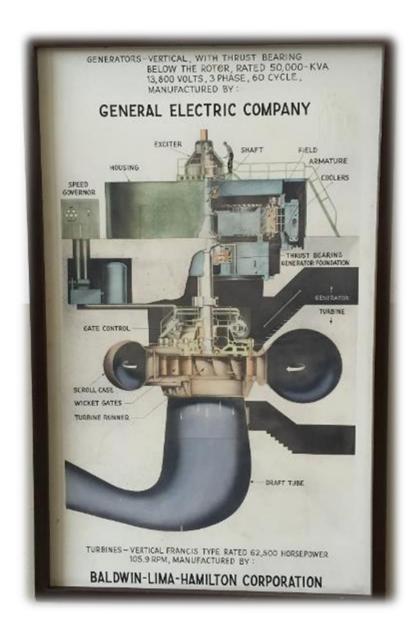




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QUESTIONS?





HYDROPOWER OPTIMIZATION INITIATIVE

CPT Olsen
Management Analyst
LRD/Nashville District
9 October 2019

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OPERATIONS DIVISION – HYDROPOWER OPTIMIZATION

INITIATIVE

Events:

- Federal Hydropower Summit leading to analysis and pursuit of methods to increase efficiency in power production
- Initiated a PDT in order to develop long-term Hydropower Optimization Strategy

Communication Objectives:

- Optimize return on investment into hydropower operations, increasing reliability, and responsibly stewarding jobs and resources
- Maintain transparency between USACE leadership, employees, and key stake holders in the region

Activities:

- Conducted site visits and personnel meetings at Cordell Hull, Old Hickory, Barkley, Dale Hollow, Wolf Creek
- TVA HQ's hosted us twice to share lessons learned and their best practices
- Initiated PDT Activity on 19 September 2019
- Initial objective is to achieve remote capability at all plants within district, before transitioning to remote control from a single location in the Nashville metropolitan area
- Expected project time horizon of ~10-years

Key Take-Away:

 Nashville District will pursue innovative ways to increase efficiency and reliability of the renewable energy resource that hydropower provides to SEPA

